CHEERS (PWS # 5160069)
SOURCE WATER ASSESSMENT FINAL REPORT

April 17, 2003

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Federal Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. The Idaho Department of Environmental Quality (DEQ) is completing the assessments for all Idaho public drinking water systems.

The assessment for your particular drinking water source is based on a land use inventory within a 1,000-foot radius of your drinking water source, sensitivity factors associated with the source, and characteristics associated with either your aquifer or watershed in which you live.

The delineation process establishes the physical area around a drinking water source that will become the focal point of the assessment. The arbitrary-fixed radius method was used to delineate transient water systems (Idaho Source Water Assessment Plan, pg. 15 and E5-E6) by drawing a 1000-foot radius circle around the drinking water sources. This distance is the same for every transient drinking water source. It is impractical to develop more intensive delineations for these systems because of limited resources for protection and lack of jurisdiction over land use outside property boundaries.

This report, *Source Water Assessment for the Cheers: Public Water System (PWS) #5160069* describes the public drinking water system, the associated potential contaminant sources located within a 1,000-foot boundary around the drinking water source, and the susceptibility (risk) that may be associated with any associated potential contaminants. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this system. **The results should not be used as an absolute measure of risk and is not intended to undermine the confidence in your water system.**

Final susceptibility scores are derived from equally weighing system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential Contaminants/Land Uses are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The *Cheers* drinking water system consists of one ground water well that serves approximately 25 people through one connection. The system rated highly susceptible to IOCs, VOCs, SOCs, and microbial contaminants. The well is located in a pit under a gravel driveway resulting in a high system construction rating. Additionally, the urban land use and the high agricultural chemical use of the county also contributed to the overall susceptibility of the Cheers drinking water system.

Though nitrate currently is not above the maximum contaminant level (MCL) of 10 milligrams per liter (mg/L), it has been detected in the well water in September 1999 at 5.32 mg/L, a level greater than one-half the MCL. EPA requires reporting in the Consumer Confidence Report (CCR) if concentrations of regulated compounds are greater than half their MCL. Further information and health side effects can be researched at http://www.epa.gov/safewater/ccr1.html.

The initial computer generated contaminant source inventory conducted by DEQ identified a gravel pit as a potential contaminant source within the 1,000-foot boundary. The Geographic Information System (GIS) map shows that the delineation includes Highway 30, the Snake River, the Union Pacific Railroad, and a city road as potential contaminant sources. Additionally, the 2000 Ground Water Under Direct Influence (GWUDI) field survey indicates that the well sits approximately 200 feet from a septic system and about 100 feet from the main part of the parking lot for the bar. All of these potential contaminant sources can contribute contaminants to the aquifer in the event of an accidental spill or release or in the event of a flood. The table below lists these contaminants. A copy of the susceptibility analysis worksheet for the well for your system along with a map showing any potential contaminant sources is included with this summary.

Table 1. Cheers, Well #1, Potential Contaminant Inventory

Site #	Source Description[1]	Source of Information	Potential Contaminants[2]
1	Mine-Sand &Gravel	Database Search	IOC, VOC, SOC, Microbials
	Highway 30	GIS Map	IOC, VOC, SOC, Microbials
	Snake River	GIS Map	IOC, VOC, SOC, Microbials
	Union Pacific Railroad	GIS Map	IOC, VOC, SOC, Microbials
	Road	GIS Map	IOC, VOC, SOC, Microbials
	Septic System	2000 GWUDI Survey	IOC, Microbials
	Parking Lot	2000 GWUDI Survey	IOC, VOC, SOC, Microbials

[2] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Analysis

The susceptibility of each well to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquitard) above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity was moderate for the Cheers well. The moderate score was based upon poor to moderately drained soil classes as defined by the National Resource Conservation Service (NRCS). Poor to moderately draining soils tend to impede the migration of contaminants to the aquifer. A well log was unavailable, preventing a determination of the composition of the vadose zone, the depth to first ground water, and the presence of any fine-grained zones that could form an aquitard above the producing zone of the well.

System Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards and the well casing is vented, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

System construction for the well was rated highly vulnerable to contamination. A well log for the Cheers well was unavailable, limiting the information concerning thickness, diameter, and depth of the casing, the placement of the annular seal, the location of the highest producing zone, and the depth of the static water level. The 2000 sanitary survey indicates that the well is located in a pit that is buried under the gravel part of the parking lot to the bar. Therefore, the sanitary inspector was unable to inspect the well head and surface seals and it appeared that the casing did not extend up to 12 inches above the floor surface to properly protect is from surface flooding. However, the well is located outside a 100-year floodplain.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thickness, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Well tests are required at the design pumping rate for 24 hours or until stabilized drawdown has continued for at least six hours when pumping at 1.5 times the design pumping rate. Though the well may have met standards at the time of construction, current construction standards are stricter. In this case, there was insufficient information available to determine if the well meets all the criteria outlined in the IDWR Well Construction Standards.

Potential Contaminant Source and Land Use

The well rated high for IOCs (e.g., arsenic, nitrate) and SOCs (e.g., pesticides), and it rated moderate for VOCs (e.g., petroleum products) and microbial contaminants (e.g., bacteria). Total coliform bacteria were detected in January 1993, September 1993 with a repeat detection and in June and July 1997. However, no further detections have occurred in the system. No VOCs or SOCs have been detected in the drinking water.

The IOC nitrate was detected in the well water in September 1999 at 5.32 mg/L, a level greater than one-half the MCL of 10 mg/L. EPA requires reporting in the Consumer Confidence Report (CCR) if concentrations of regulated compounds are greater than half their MCL. Further information and health side effects can be researched at http://www.epa.gov/safewater/ccr1.html.

Additionally, the well delineation crosses a nitrate priority area and an organic contaminant priority area of the pesticide atrazine. A nitrate priority area is an area where greater than 25% of the wells/springs in the area show nitrate values greater than 5 milligrams per liter (mg/L). An organic contaminant priority area is a region where greater than 25 % of the wells in the area show levels greater than 1% of the primary standard or other health standards. The agricultural land use within the county led to the it being rated “high” for nitrogen fertilizer use, herbicide use, and total agricultural chemical use.

Final Susceptibility Rating

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a confirmed detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, having potential contaminant sources within 50 feet of the wellhead will give an automatic high susceptibility rating. Having multiple potential contaminant sources within the 1000-foot radius of the well and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, the well rated high to IOCs, VOCs, SOCs, and microbial contaminants. The high system construction score combined with the urban land use and the high agricultural chemical use of the county contributed to the overall susceptibility of the Cheers drinking water system.

Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the Cheers, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). The Cheers bar will need to raise the well casing to at least 12 inches above the top of the pit to properly protect it from surface flooding. Additionally, the bar should construct some form of access to the wellhead seal and surface seal to allow for inspection and maintenance. Partnerships with state and local agencies and industry groups should be established and are critical to success. You may want to establish a dialog with the relevant state and local agencies related to wellhead protection. Drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Providing a well log to the state and local agencies may assist them in determining your drinking water protection needs.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. For areas where transportation corridors transect the delineation, the Department of Transportation should be included in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

Assistance

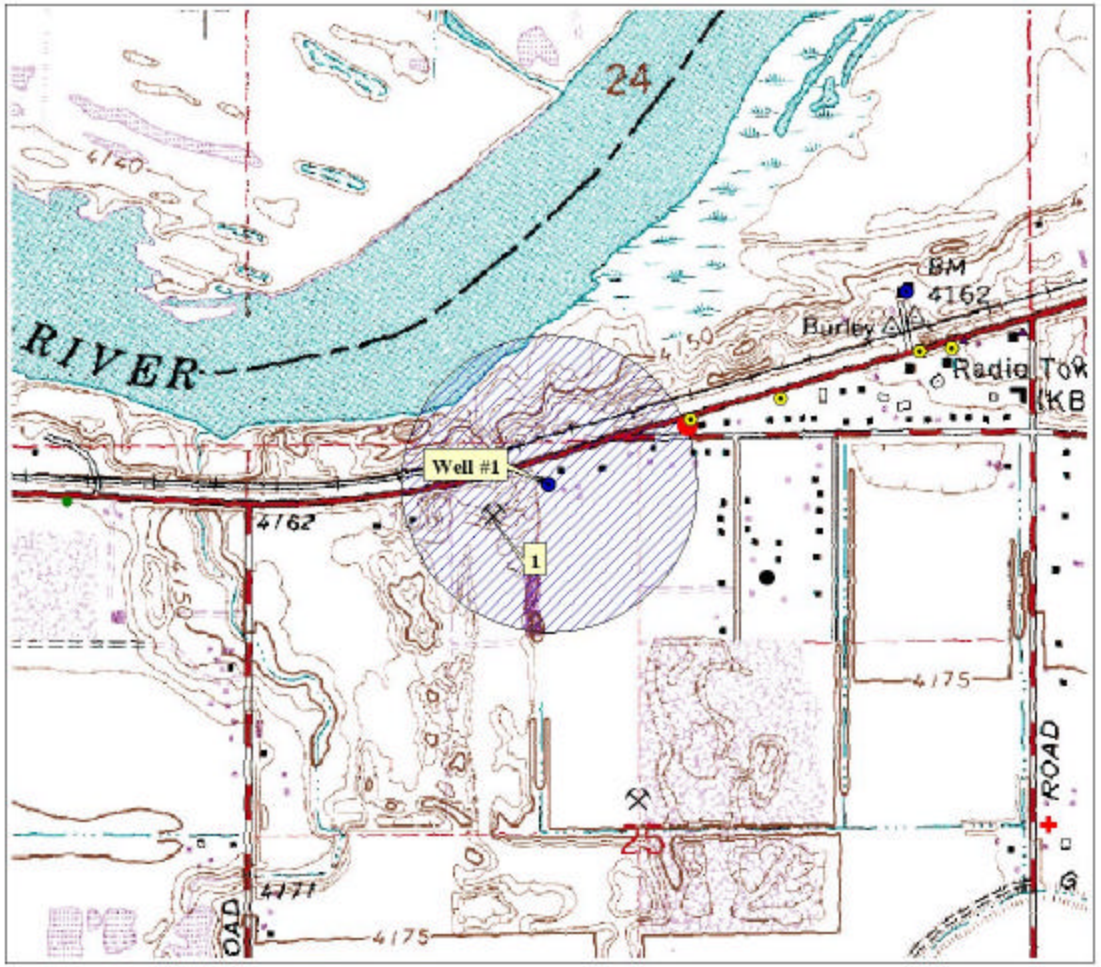
Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Twin Falls Regional DEQ Office	(208) 736-2190
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper (mlharper@idahoruralwater.com), Idaho Rural Water Association, at (208) 343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

Cheers: Well #1
PWS Number: 5160069



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Legend

- Wellhead
- Enhanced Inventory
- Toxic Release Inventory
- CERCLIS Site
- RICRIS Site
- Business Mailing List
- Dairy
- LUST Site

UST Site

- Closed
- Open
- NPDES Site
- Mine
- AST
- Recharge Point
- SARA Title III Site (EPCRA)
- Injection Well
- Group1 Site
- Cyanide Site
- Boise VOCs
- Landfill
- Wastewater Land App.Site
- Transient Delineation

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POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "*Recommended Standards for Water Works.*"

Idaho Department of Environmental Quality, 1997. *Design Standards for Public Drinking Water Systems.* IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. *Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules*. IDAPA 37.03.09.

Idaho Division of Environmental Quality, 1999, Idaho Source Water Assessment Plan, October.

South Central District Health Department, 2000. Sanitary Survey Inspection and Report for Cheers PWS #5160069.

South Central District Health Department, 2000. Ground Water Under Direct Influence Field Survey for Cheers PWS #5160069.

State Drinking Water Information System (SDWIS). IDEQ. 2003.

Susceptibility Analysis Formulas

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.27)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : CHEERS Well# : WELL #1

Public Water System Number 5160069 3/10/03 10:38:49 AM

1. System Construction		SCORE
Drill Date	UNKNOWN	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	2000
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	NO	1
	Total System Construction Score	6

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
	Total Hydrologic Score	4

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	URBAN/COMMERCIAL	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2

Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	7	6	6	7
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	7	6	6	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	2	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		14	12	14	8
Cumulative Potential Contaminant / Land Use Score		16	14	16	10
4. Final Susceptibility Source Score		14	14	14	14
5. Final Well Ranking		High	High	High	High